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91 and wherein the interface means depicts the flexure of the part of the body based on the intensity of the analog signal.

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61. The apparatus according to claim ~~60~~<sup>65</sup> wherein the analog signal is a function of voltage.

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REMARKS

Claims 1-47 are pending. Claims 48-61 have been added.

In the parent application, claims 13-15 were rejected under 35 U.S.C. §102(b) as being anticipated by Haney. This basis for rejection is respectfully traversed.

Haney discloses a method for producing animation. In particular, a computer 10 has a storage unit 12 with a description of the characteristics of the animated character to be produced. For example, stored in digital form within the computer storage 12 will be a series of animated characters of a general form and in a wide variety of stances and positions. A camera 22 records the actions of a live actor 24. The live actor 24 will wear or have otherwise attached to his body reflective or aluminum elements A through L at various reference points on his body. The information picked up by the camera 22 is digitized and fed to the computer. The computer then

performs a pattern recognition algorithm to match the position of the reflective or luminous elements on a point by point basis with the composite figure within the computer storage. Once a match is found, the resulting animated figure is output on a CRT 28 and thereafter transferred to a transparency maker 32.

Applicant's claim 13 has been amended to clarify that Applicant's cursor is displayed in real time. This is clearly not the case in Haney because of the pattern recognition program required and the time required for transferring the image from the CRT 28 to the transparency maker 32. Thus, claims 13-15 are not anticipated by Haney. Furthermore, claims 13-15 are not rendered obvious by Haney because there is no disclosure or suggestion in Haney of how to produce such animation in real time.

Claims 16-19 and 33-41 were rejected under 35 U.S.C §103 as being unpatentable over Haney. Since the rejection of claims 13-15 have been overcome, it is believed that claims 16-19 are now patentable as well. With respect to claims 33-41, claim 33 has been amended to clarify that the cursor is displayed in real time as in claims 13-15. Thus, since Haney neither discloses nor suggests an apparatus

capable of operating in real time, claims 33-41 are now believed to be patentable.

Claims 1-3, 8, 10-11, 16-23 and 38-45 have been rejected under 35 U.S.C. §103 as being unpatentable over Haney as applied to claims 19 and 41, and further in view of Grimes and Lefkowitz. This basis for rejection is respectfully traversed.

Grimes discloses a data entry device for a computer. The data entry device comprises a glove having a plurality of sensors disposed at selected locations thereon. The sensors are located so that when the hand is in a position which indicates a number or letter of the alphabet in sign language, then a signal is sent to the computer which indicates the letter or number depicted.

Grimes also discloses a sensor for detecting when a part of the hand is flexed by a prescribed amount. However, the sensor acts as a switch and only detects the fact of bending and does not indicate the degree of flexure of the hand. In Grimes, the glove acts like a conventional keyboard and merely transmits letters and numerals to the computer. The position, orientation and/or flexure of the hand is not displayed by the Grimes computer.

Lefkowitz discloses a control interface between a physical object, such as a part of the human body, and a machine such as a computer. Movement of the physical object in a defined field is sensed, and signals corresponding to such movement are received, detected, amplified, and produced as an input signal to the machine to move an element (e.g. a display cursor) of the machine in the same direction as, and in an amount proportional to, movement of the object.

The field is created by one or more antennas which are coupled to one of a pair of ultrasonic oscillators. The frequency of one of the oscillators coupled to the antennae varies from the frequency of the second oscillator when a physical object moves towards or away from the antennae. This is caused by added body capacitance when the body is in the field. The body capacitance is communicated to the oscillator in the form of added capacitance to the oscillator circuit. The added capacitance causes the oscillator frequency to lower. A voltage proportional to the difference in the frequency of the two oscillators is used to indicate the distance of the body from each antennae. Because of the nature of the Lefkowitz device, position and orientation information is not registered.

The Examiner states that Haney teaches that if the positions of a body can be sensed, then they can be displayed, thus making it obvious to sense hand movement as taught by Grimes, and the movement can be used as inputs to the device of Haney to animate the gestures of Fig. 17 of Grimes. However, obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention absent some teaching or suggestion supporting the combination. Under section 103, teachings of references can be combined only if there is some suggestion or incentive to do so. ACS Hospital Systems, Inc. v. Montefiore Hospital et al., 732 F.2d 1572 (Fed.Cir. 1984). Notice that the Applicants are not saying that the prior art must expressly suggest the combination or that the various devices of the prior art must be capable of direct physical incorporation into one or another. Rather, the Applicant is saying that the mere fact that the prior art could be combined would not have made the combination obvious unless the prior art suggests the desirability or advantages of the combination. See, e.g. In Re Sernaker, 217 U.S.P.Q. 1, 6 (Fed.Cir. 1983). In this case, it is not the purpose of Grimes to depict the orientation of the hand, and the information transmitted to the computer in Grimes is that of

letters or numerals. The information about the flexure of the hand is completely lost before it is transmitted to the computer, and there is no incentive to reconstruct such information because that would be counter-productive. The same holds true in the Lefkowitz device. Furthermore, the Haney device relies upon the sensors being within the line of sight of the camera. If such a technique was applied to Grimes, the sensors would often be covered by overlapping portions of the hand. Thus, there is no incentive or advantage to applying the Haney technique to the Grimes device. In any event, the resulting combination still would not work in real time as claimed by the Applicant.

Claims 4-7 and 9 have been rejected under 35 U.S.C §103 as being unpatentable over Haney in view of Grimes and Lefkowitz as applied to claims 1 and 2, and further in view of Harrington and Davison. This basis for rejection is respectfully traversed.

The Examiner states that Harrington and Davison are cited to teach the conventional use of ultrasonics to provide relative positional information which could have been used in the device to Haney as modified. However, the Haney device relies upon optical sensing and pattern recognition to provide the animated figure. If ultrasonics

were used, there would be no visible signal to compare and the Haney device would be rendered inoperable for its intended purpose. When modification of a primary reference in a proposed manner would render it inoperable for its intended purpose, that is strong evidence of nonobviousness. In re Gordon, 221 U.S.P.Q. 1125 (Fed.Cir. 1984).

Claim 12 was rejected under 35 U.S.C. §103 as being unpatentable over Haney in view of Grimes and Lefkowitz as applied to claim 1 and further in view of King. This basis for rejection is respectfully traversed.

King discloses a cursor control system for use with a data terminal having a display. The system consists of an infrared radiation source and an associated radiation sensor. As with the Harrington and Davison references noted above, infrared is invisible and therefore would render the Haney device inoperable for its intended purpose. Thus, as with Harrington and Davison, King et al. teaches away from the proposed modification.

Claims 24-32 and 46-47 were rejected under 35 U.S.C. §103 as being unpatentable over Haney as applied to claims 13-19 and 33-41 and Haney in view of Grimes as applied to claim 45, and further in view of Lefkowitz and Baer et al. The Examiner states that although the device to Haney is not

used in an interactive environment, Lefkowitz provides the motivation to use the device of Haney in an interactive device. This basis for rejection is respectfully traversed.

Because the rejection of claims 13-19, 33-41 and 45 have been overcome, the presently rejected claims should be allowable for the same reason. Furthermore, the determination of whether a novel structure is or is not obvious requires cognizance of the structure and properties of the prior art devices, and the problems that the prior art devices solve. The purpose of the Haney device is to produce still photographs of an animated character. Because of this purpose, there is no motivation to use the device in an interactive fashion. Lefkowitz is unconcerned with using the orientation and/or flexure of a part of the user's body to manipulate a cursor. In fact, as noted above, the flexure and orientation information of the user's hand is completely lost because Lefkowitz operates on the principal of body capacitance. Thus, the prior art provides no motivation to combine the references relied upon by the Examiner, and the result still would not be Applicant's claimed invention.

Accordingly, it is believed that the rejections under 35 U.S.C. §§102 and 103 in the parent case have been



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overcome by the foregoing amendment and remarks, and it is  
submitted that the claims are in condition for allowance.

Respectfully submitted,

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